EXTRONICS®

CE

Ex

Operating Manual

iGAS100

II2 GD Ex d IIC T6
Ex tD A21 IP 68 T85℃

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Contents

1 Introduction 6
2 Safety Information and Notes 7
2.1 Storage of this Manual 7
2.2 List of Notes 7
3 Gas Detector Types 8
3.1 Pellistor Technology 8
3.2 Infra Red Technology 8
3.3 Toxsin Technology (Fuel Cell) 8
4 Junction Box types 10
4.1 JB1 10
4.2 JB2 10
4.3 JB3 10
4.4 JB4 10
4.5 JB5 10
5 Installation 11
5.1 Customer sealing and earthing responsibilities 11
5.1.1 Earthing requirements 12
5.2 Termination details 12
5.2.1 JB1 Terminations 12
5.2.2 Termination Details JB2 for 102 Sensors 13
5.2.3 Termination details for JB 2 MK3 Pellistors 14
5.3 Basic Operation of JB 3,4 and 5 15
5.3.1 Basic Layout 15
5.3.2 Powering on the system 15
5.3.3 What to do if the alarm operates 16
5.3.4 Editing and Display Options 17
5.3.5 Entering the USER password 17
5.3.6 Users Menu 18
5.3.7 Fault Conditions 19
5.3.8 Over or Under Range Indication 19
5.3.9 Password Protected Menus 20
5.4 Zero and Calibration 21
5.4.1 Equipment for Calibration and Methodology 22
5.4.2 Calibration Requirements 22
5.4.3 Example of Required Calibration Equipment 23
5.5 Selecting to Zero The iGAS100 24
5.6 Selecting to Calibrate the iGAS100 25
6 Intended Purpose Usage 29
6.1 Transportation and Storage 29
6.2 Authorized Persons 29
6.3 Cleaning and Maintenance 29
6.4 Safety Precautions 30
6.5 Cleaning and Maintenance Intervals 30
6.6 Aggressive substances and environments 30
6.7 Exposure to external stresses 30
7 Technical Data 31

8 Type Codes 32
9 ATEX Marking 33
10 Certification 35
11 Manual Revision 42

1 Introduction

The iGAS100 series of gas detectors are designed to provide an accurate, cost effective and reliable gas detection solution. The iGAS100 range incorporates a number of sensing technologies, each of which can be utilised in a standard field housing with no field display or alternatively a field housing with a local display which can be adjusted using magnets for calibration and alarm set point adjustment.
The iGAS100 series of detectors utilise microprocessor technology to give a stable process signal output, and allow for a 4-20mA or digital addressable output signal.
The digitally addressable sensors are installed on a single cable run, which dramatically reduces installation costs.
The iGAS100 series of sensors can be combined with the iGAS700 controller for local display and calibration.
The integrated processor can be used to pre-calibrate the sensor prior to installation. Alternatively calibration can be achieved on site via the Extronics control panel or locally using a handheld PC device or laptop.

2 Safety Information and Notes

2.1 Storage of this Manual

Keep this user manual safe and in the vicinity of the device. All persons who have to work on or with the device should be advised on where the manual is stored.

2.2 List of Notes

The notes supplied in this chapter provide information on the following.

- Danger / Warning.
  - Possible hazard to life or health.
- Caution
  - Possible damage to property.
- Important
  - Possible damage to enclosure, device or associated equipment.
- Information
  - Notes on the optimum use of the device

Important	**Ensure that the cable is used which suits the environment in which the iGAS100 is installed.**

Important	**The housing must be grounded to a minimum 20A ground.**

Important	**If the iGAS100 is to be used in a hazardous area ensure the certification marks on the side of the main housing match the zones certification requirements. In such cases do not operate the iGAS100 without the cover correctly screwed in place.**

Important	**The iGAS100 must be supplied via a suitable fuse or circuit breaker.**

Note	**Use 1.5mm2 Cable**

Note	**Do not Exceed 50 metres for Pellistor sensors**

Note	**Do not Exceed 200 metres for 4-20mA devices.**

Note	**All cable entries are M20 x 1.5mm**

3 Gas Detector Types

3.1 Pellistor Technology

The pellistor or catalytic gas detector is based upon the whetstone bridge circuit. A current passes through the bridge and heats the circuit to a specific temperature. One of the resistors imbedded in a glass bead is exposed to the sample or target gas in the detector housing and located behind a scintered metal flame arrestor.
Upon being exposed to the target gas a change in the surface temperature of the bead occurs as the target gas is oxidised causing a change in the beads resistance creating an electrical imbalance in the bridge circuit.
The measured electrical change is proportional to the concentration of target gas. A gas detector must generally be calibrated with the target gas in air at a known concentration.

Pellistor technology has a proven historic background stretching back many decades and is one of the commonest and least costly forms of monitoring flammable gas leaks.

Pellistors can be calibrated for the measurement of non-organic gases such as hydrogen and carbon monoxide.
The Pellistor normally expresses the measured value as a percentage of the Lower Explosive Limit of the gas (%LEL)

3.2 Infra Red Technology

Infra Red technology is based upon emitted energy absorption by the target gas. An infra red source located behind a scintered metal flame arrestor emits pulsed Infra Red energy. When the sensor is exposed to the target gas the gas absorbs energy. The measured difference between the emitted energy and the remaining energy is proportional to the concentration of the target gas.
This value can be expressed as a percentage of the Lower Explosive Limit of the gas (%LEL), or alternatively as a percentage by volume of a mixture.
Infra red energy is not absorbed by all gases, for example molecules which are diatomic of the same element such as, hydrogen (H_2), Chlorine (Cl_2), Oxygen (O_2) do not absorb Infra Red radiation hence they cannot be measured using this technology.

3.3 Toxsin Technology (Fuel Cell)

Toxsin Cell Technology is based on a fuel cell which in essence is a battery. A fuel cell is located behind a semi permeable membrane and when it is exposed to a target gas a reaction on the surface occurs causing a current to flow in the cell. The current flow is proportional to the amount of gas present. The concentration is

expressed either as a percentage by volume or alternatively in parts per million (ppm).
Fuel cell technology is generally used for the measurement of inorganic compounds such as oxygen, hydrogen sulphide, hydrogen chloride, chlorine, etc.

4 Junction Box types

The iGAS100 series of gas detector solutions can be used with 4 different junction box configurations, which allow flexibility when deploying gas detection solutions.

4.1 JB1

The JB1 configuration is a basic Exd junction box which has a set of screw terminals to connect directly to the gas detector. This type junction box can be with Toxic and Infrared gas detectors.
The output from each of these gas detectors is a regular 4-20mA signal.

DANGER!	**The 4-20mA signal is NOT intrinsically safe. Never connect the output of the sensor to an intrinsically safe source without the use of a safety barrier.**

4.2 JB2

The JB2 configuration is a junction box with an added digitally addressable PCB, this configuration can only be used in conjunction with the iGAS700 controller.

4.3 JB3

The JB3 configuration is a junction box with an added local display and a 4-20mA output. This type of junction box can be used as a standalone sensor or as part of a larger system. The JB 3 solution has the alarm relay option fitted

4.4 JB4

The JB4 configuration is identical as the JB3 configuration without the Alarm Relay outputs.

4.5 JB5

The JB5 configuration is identical to the JB4 with the addition of the digitally addressable PCB, this configuration can be used in conjunction with the iGAS700 controller.

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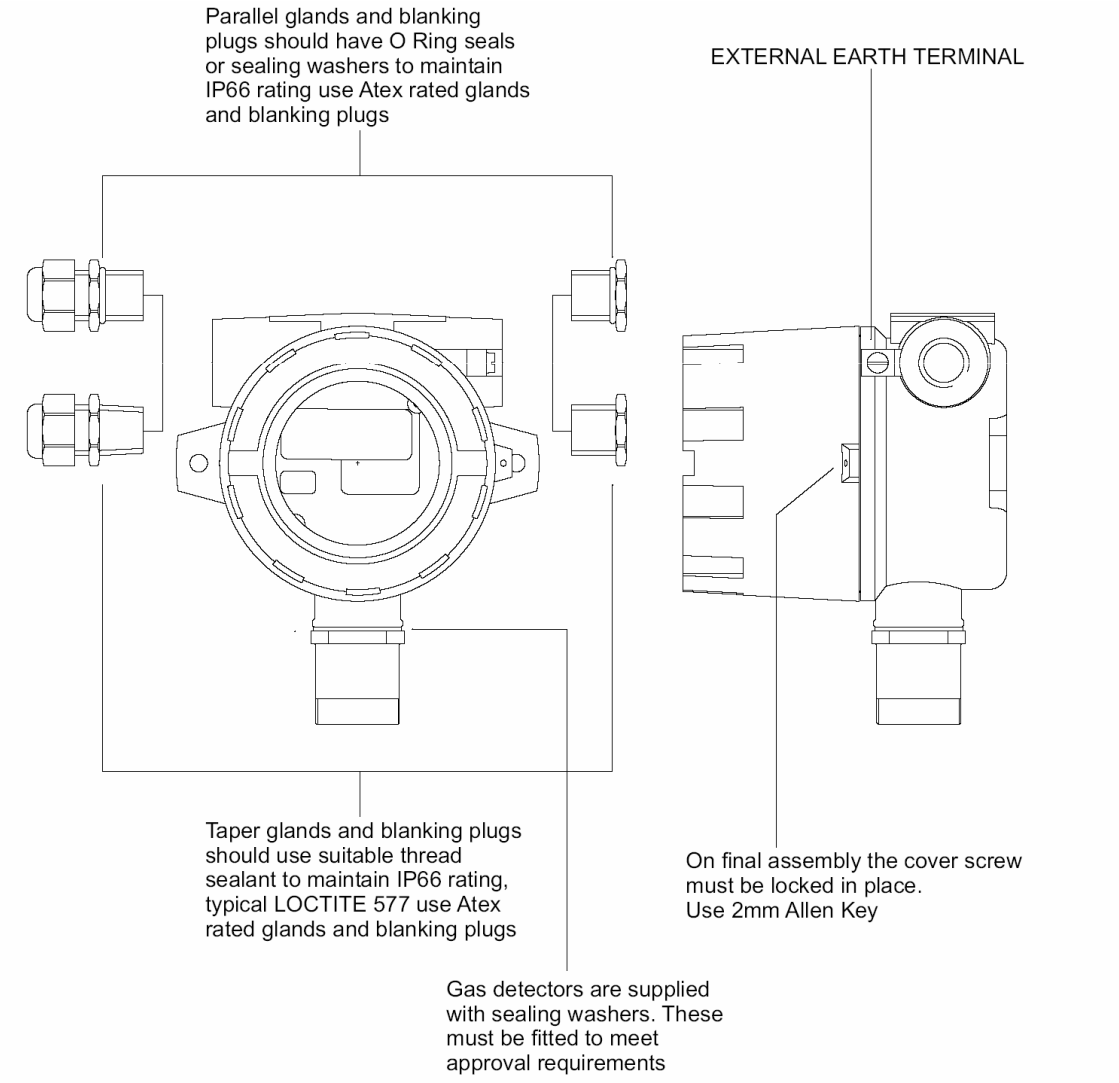
5 Installation

5.1 Customer sealing and earthing responsibilities

The iGAS100 range is designed for use in Zone 1 and Zone 2 hazardous areas and is ATEX certified. To maintain compliance it is imperative the installer of the equipment observes the following installation guidelines. Failure to do so could compromise the protection concept of the equipment. All Cable entries are M20x1.5mm.


Parallel glands and blanking plugs should have O Ring seals or sealing washers to maintain IP66 rating use Atex rated glands and blanking plugs
EXTERNAL EARTH TERMINAL
Taper glands and blanking plugs should use suitable thread sealant to maintain IP66 rating, typical LOCTITE 577 use Atex rated glands and blanking plugs
On final assembly the cover screw must be locked in place. Use 2mm Allen Key
Gas detectors are supplied with sealing washers. These must be fitted to meet approval requirements

5.1.1 Earthing requirements

External Earth

The External Earth should either be cabled in 4mm2 Stranded cable, or 6.0mm2 Solid cable

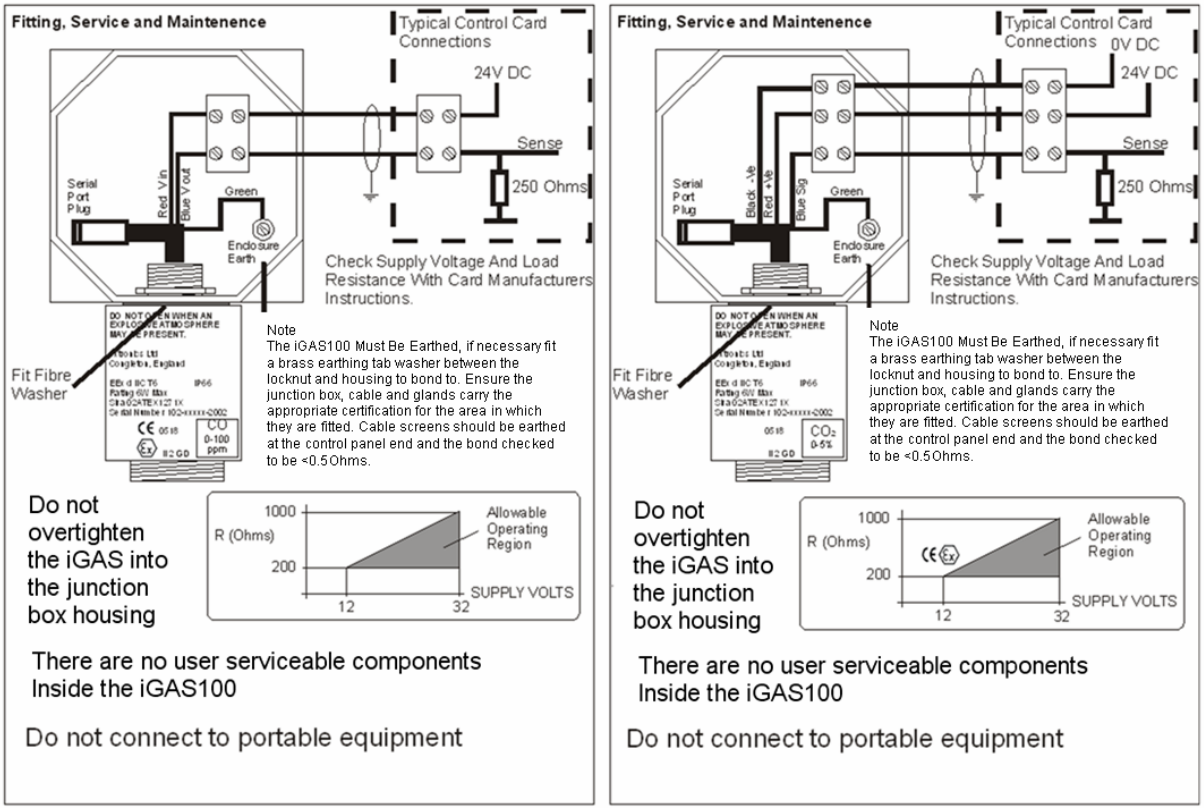
Internal Earth

The Internal Earth should either be cabled in 1.5mm3 Stranded cable, or 2.5mm Solid Cable.

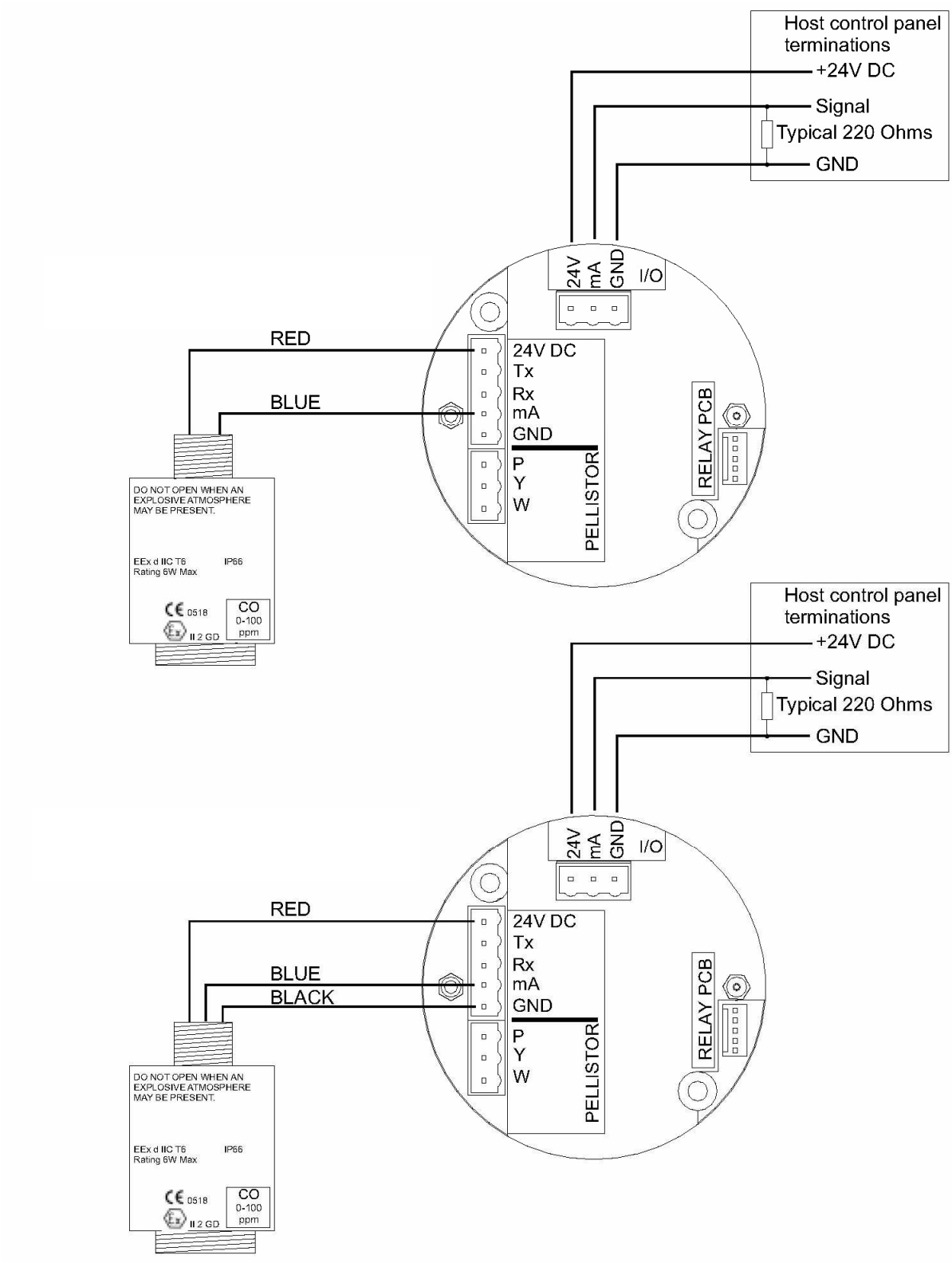
Warning Glands and cables must be suitable for the zone of application

5.2 Termination details

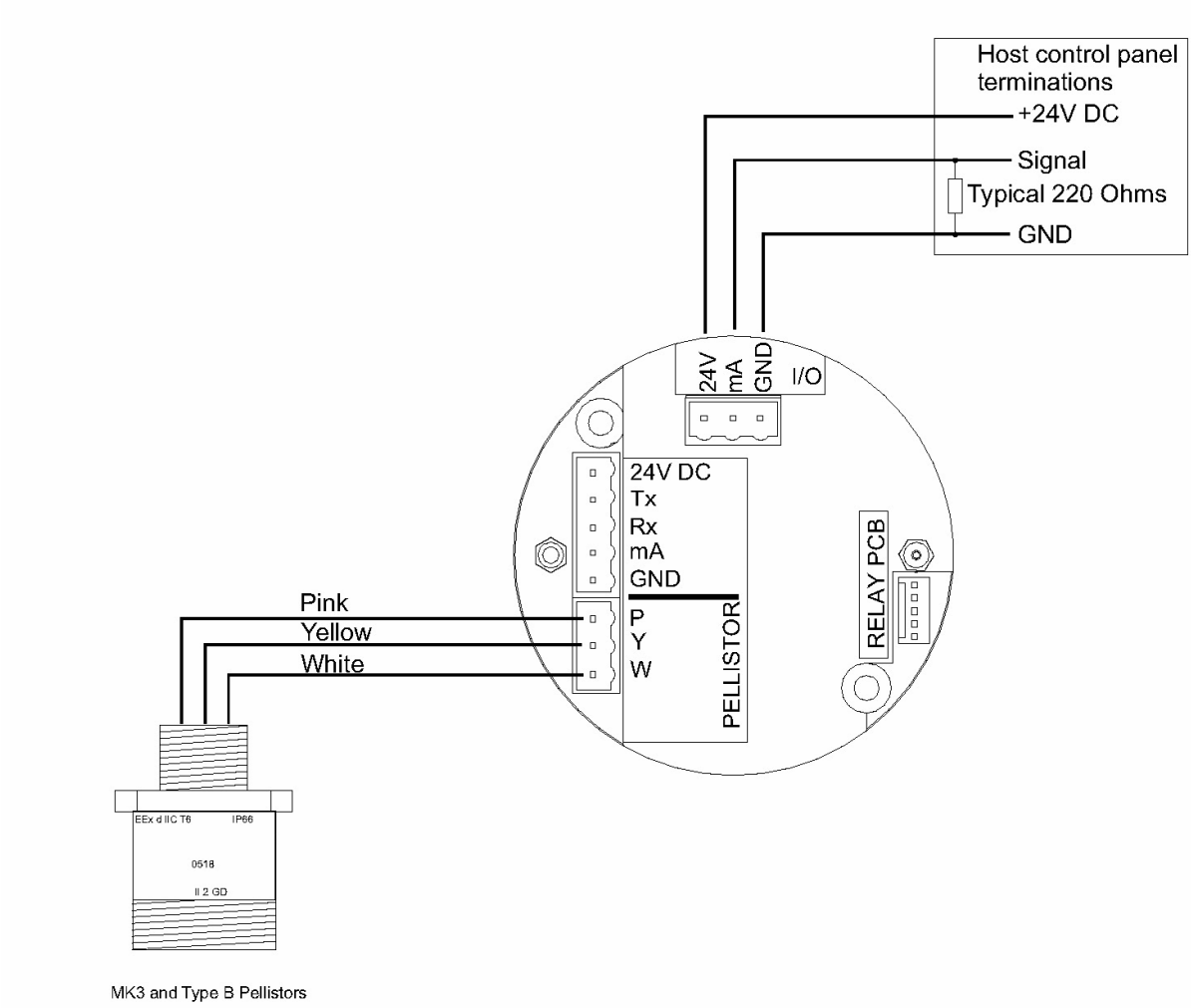
5.2.1 JB1 Terminations


Fitting, Service and Maintenence
Typical Control Card Connections
24V DC
Sense
250 Ohms
Serial Port Plug
Red Vin
Blue Vout
Green
Enclosure Earth
Check Supply Voltage And Load Resistance With Card Manufacturers Instructions.
Fit Fibre Washer
Note
The iGAS100 Must Be Earthed, if necessary fit a brass earthing tab washer between the locknut and housing to bond to. Ensure the junction box, cable and glands carry the appropriate certification for the area in which they are fitted. Cable screens should be earthed at the control panel end and the bond checked to be <0.5Ohms.
Do not overtighten the iGAS into the junction box housing
1000
R (Ohms)
200
12
32
Allowable Operating Region
SUPPLY VOLTS
There are no user serviceable components Inside the iGAS100
Do not connect to portable equipment
Fitting, Service and Maintenence
Typical Control Card Connections
0V DC
24V DC
Sense
250 Ohms
Serial Port Plug
Black -Ve
Red +Ve
Blue Sig
Green
Enclosure Earth
Check Supply Voltage And Load Resistance With Card Manufacturers Instructions.
Fit Fibre Washer
Note
The iGAS100 Must Be Earthed, if necessary fit a brass earthing tab washer between the locknut and housing to bond to. Ensure the junction box, cable and glands carry the appropriate certification for the area in which they are fitted. Cable screens should be earthed at the control panel end and the bond checked to be <0.5Ohms.
Do not overtighten the iGAS into the junction box housing
1000
R (Ohms)
200
12
32
Allowable Operating Region
SUPPLY VOLTS
There are no user serviceable components Inside the iGAS100
Do not connect to portable equipment

5.2.2 Termination Details JB2 for iGAS100 Sensors



5.2.3 Termination details for JB 2 MK3 Pellistors



MK3 and Type B Pellistors

5.3 Basic Operation of JB 3,4 and 5

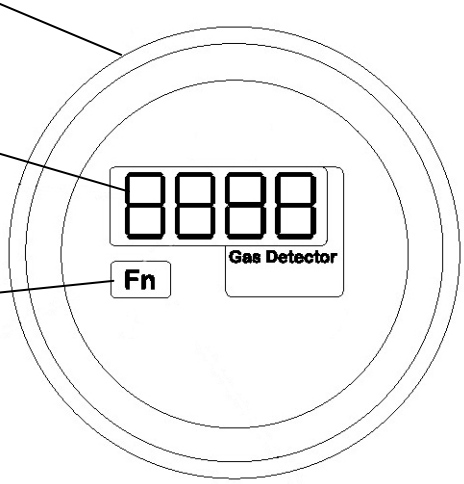
Before attempting to operate the iGAS100 single channel gas detectors ensure that the installation ad calibration instructions have been followed.

5.3.1 Basic Layout

A calibration label will be fitted to the side of the unit. This label will indicate when the system is next due for calibration. Regular calibration (usually 6 months) is vital for correct operation.

The gas being monitored by the iGAS100 will be indicated in this area along with the units of measure.

The Function button is used to cancel alarms or access the internal software function and system set up.



5.3.2 Powering on the system

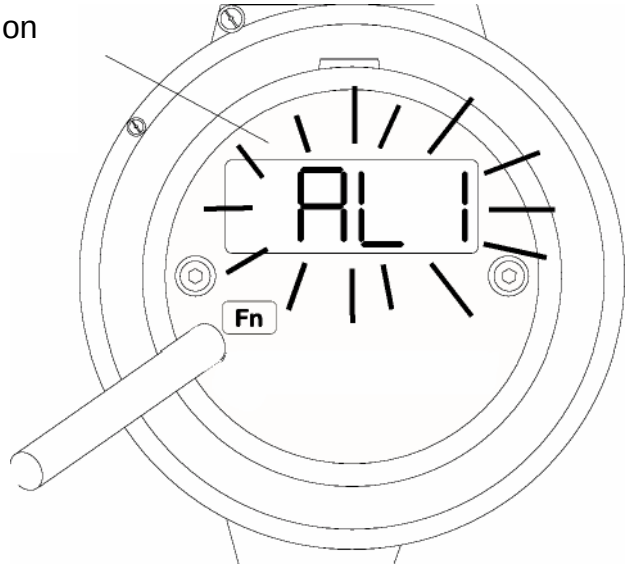
After ensuring correct installation of the iGAS100 the unit may be switched on. When first switched on the iGAS100 will first display T903 then its software version, sensor type, range, address and then commence a 300 second count down timer. This allows the sensor to stabilise before operation. During this time the analyser alarm outputs are off and the 4-20mAoutput is fixed at 4mA. At the end of the count down the unit will indicate either '903' or a continuously updating gas concentration depending which mode of operation has been selected.

5.3.3 What to do if the alarm operates

The iGAS100 JB3 & JB4 are fitted with a number of interfaces which may be connected to other systems in the location that the gas detector is being used. For instance the iGAS100 could be set up to cut off the mains gas supply to a boiler in the event of a gas leak or it could be set up to activate alarms external to the unit in the event of a toxic gas leak.

Whatever interfaces are connected the following will happen as a minimum.

The highest alarm level that has been exceeded will flash on and off on the LED display.



The iGAS100 is fitted with a function button which is activated using a magnetic pointer provided with the system. By following the instructions in this manual the menu system can be accessed to set alarm levels change ranges or sensor type.

Use the magnetic ‘pointer’ once to mute the alarm. (The ‘SIL’, silence function) In this instance note that the outputs stay in the alarm state as does the display.
Select ‘RES’ or RESET function to reset the alarm. Note if the hazard is still present the alarms will be re-activated.

Note that the system may be configured to act as a simple 4-20mA device in which case indicated alarm levels will be disabled.

5.3.4 Editing and Display Options

As supplied and installed the iGAS100 will be programmed for the following:

1. The Target Gas. For instance Methane, Propane, Butane, Carbon Monoxide, Nitric Oxide etc
2. The levels which once exceeded will results alarm outputs AL1 and AL2 being activated
3. The range over which the sensor is to operate.

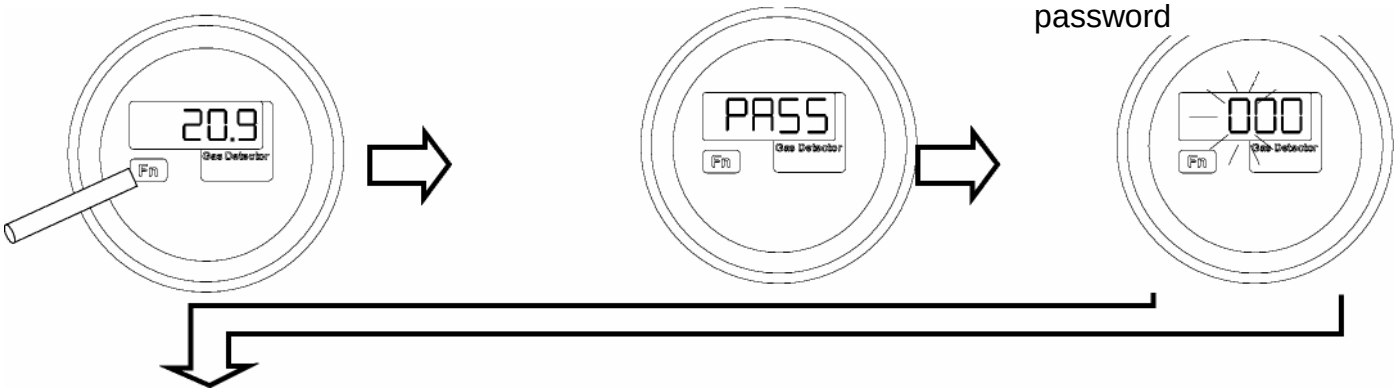
It will not normally be necessary for a user to need to change any of these parameters. To attempt to change any of the parameters without the necessary specialist knowledge and training could compromise the performance of the gas detector. The operator does have access to zero the unit and check or change the alarm levels. This feature is password protected. Passwords are entered as follows:

5.3.5 Entering the USER password

With the display indicating 903 hold the magnetic pointer over the Fn area..

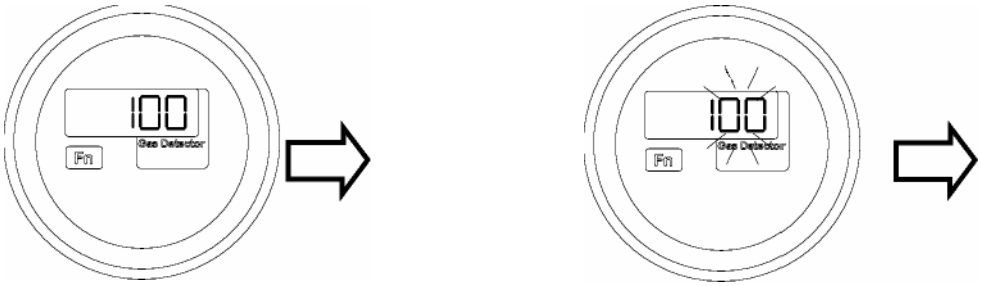
The display will indicate PASS remove the pointer when this is displayed.

The display will now indicate all zero's. The first zero will be flashing. The T903 is expecting a password



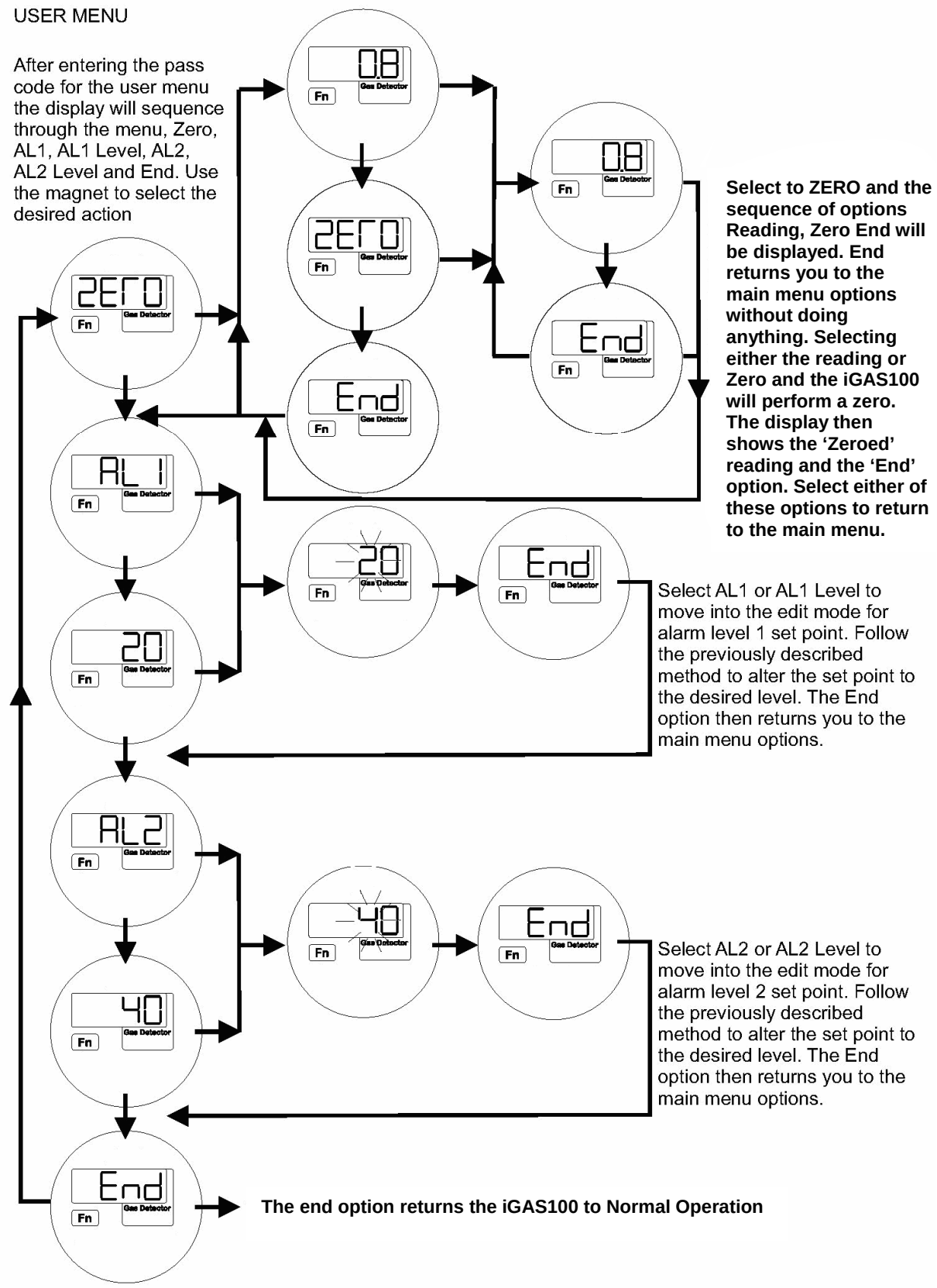
Bring the magnetic pointer over the Fn area and the digit will Increment.
Increment the display to read ‘1’

Hold the magnetic pointer Over the Fn area. Each digit In turn will flash



When all digits are flashing remove the pointer. The display will now alter to indicate the USER menu (see next section)

5.3.6 Users Menu

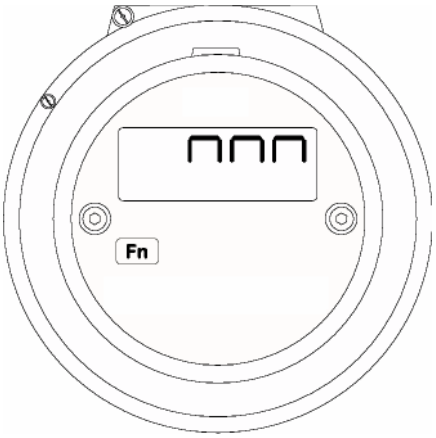

USER MENU
After entering the pass code for the user menu the display will sequence through the menu, Zero, AL1, AL1 Level, AL2, AL2 Level and End. Use the magnet to select the desired action
Select to ZERO and the sequence of options Reading, Zero End will be displayed. End returns you to the main menu options without doing anything. Selecting either the reading or Zero and the iGAS100 will perform a zero. The display then shows the 'Zeroed' reading and the 'End' option. Select either of these options to return to the main menu.
Select AL1 or AL1 Level to move into the edit mode for alarm level 1 set point. Follow the previously described method to alter the set point to the desired level. The End option then returns you to the main menu options.
Select AL2 or AL2 Level to move into the edit mode for alarm level 2 set point. Follow the previously described method to alter the set point to the desired level. The End option then returns you to the main menu options.
The end option returns the iGAS100 to Normal Operation

5.3.7 Fault Conditions

The iGAS100 can detect and report faults which may develop with the sensor.

5.3.8 Over or Under Range Indication.

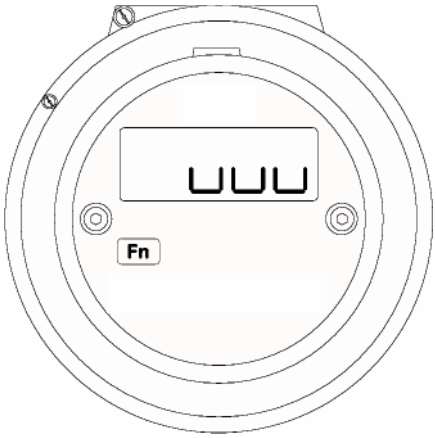
If the gas being sensed exceeds the range of the sensor fitted to the iGAS100 by more than 5% of the sensors range then this is indicated by the display indicated below.
When the gas concentration is back in range the iGAS100 reverts to normal operation.



This indicates Gas over range

If the iGAS100 is being used as a 4-20mA transmitter then the output will drop to below 4mA to indicate a fault condition

In some circumstances for example if the temperature conditions exceed the rating of the sensor or if the calibration period has been exceeded the sensor may drop below the range of the iGAS100. Should the sensor signal drop below the zero point by more than 5% of the sensors range this is indicated by the display shown below.
When the gas concentration is back in range the iGAS100 reverts to normal operation.



This indicates Gas under range

If the iGAS100 is being used as a 4-20mA transmitter then the output will drop to below 4mA to indicate a fault condition

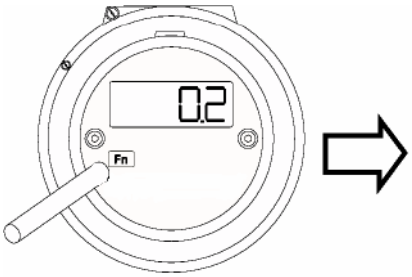
In both cases the fault must be continuously present for more than 5 seconds

5.3.9 Password Protected Menus

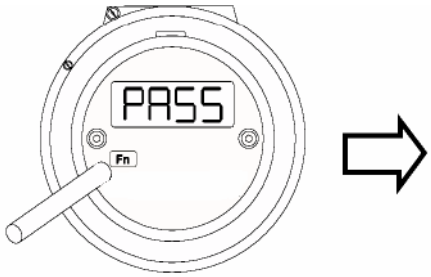
The iGAS100 stores its calibration and set up information in non-volatile memory. To access these functions it is necessary to enter a password as previously described. These password protected functions should only be carried out by trained staff otherwise problems can arise due to poor calibration or zeroing. Similarly if detector set up functions are incorrectly set then poor performance could result.

Follow the procedure described below to gain access to the system calibration and set up functions.

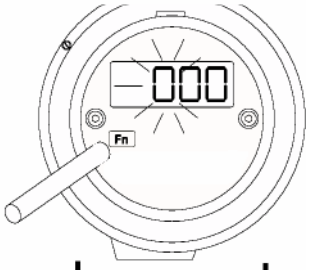
With the display indicating hold the magnetic pointer over he Fn area..

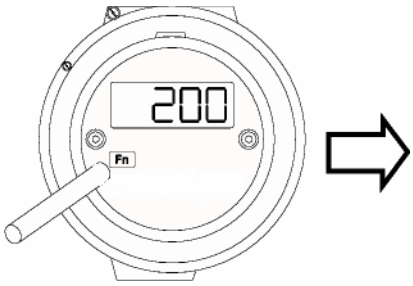


The display will indicate PASS remove the pointer when this is displayed.

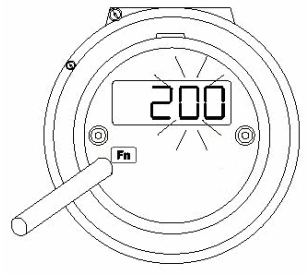


The display will now indicate all zero's. The first zero will be flashing. The iGAS100 is expecting a password



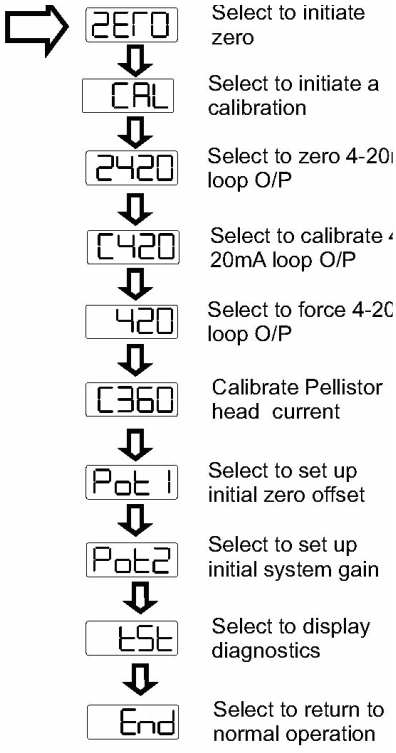


Bring the magnetic pointer over the Fn area and the digit will increment. Increment the display to read ‘2’



Hold the magnetic pointer over the Fn area. Each digit in turn will flash

When all digits are flashing remove the pointer. The display will now cycle through the available options



5.4 Zero and Calibration

Zero and Calibration.
In common with most measuring devices gas detection equipment requires regular calibration if it is to operate correctly. Gas detectors are usually calibrated using either a synthetic air mixture or Nitrogen depending on the detector to obtain a zero point and a known gas concentration to obtain a calibration point. Usually bottled calibration gas is used to calibrate the detectors. In some cases this is either not practical or simply not desirable due to the nature of the gas. In such cases electrochemical gas generators can be used or ampules of solution mixed on the spot in a known volume. In some cases, Chlorine detectors being a good example an amount of atmospheric moisture (Rh) is required for the detector to function correctly. In such cases bottled gas is of no use and a gas generator must be employed.

The frequency of calibration is governed mainly by two factors, the type of detector and the environment it is located in. Calibration records should be kept for gas detection equipment and should indicate in particular the state of calibration of the detector both before and after calibration. Examination of such records over time can then be used to determine if a detector in a given environment is capable of maintaining calibration for the chosen period. If not then consideration should be given to either reducing the interval between calibrations or choosing an alternative detection technology.

5.4.1 Equipment for Calibration and Methodology

A gas detector calibration kit will normally include:-

- Zero Gas Bottle or Air Pump/Scrubber
- Calibration Gas or Gas Generator
- Calibration Gas Adaptor (possible this is a permanent fitment in hard to reach locations)
- Gas flow Regulators
- Introduction Tubing (again possibly permanent fitment in hard to reach locations)
- Calibration Stickers (to indicate date of calibration, next due date and certificate number)

In principle the sequence of events are as follows:-

1. Inhibit the control panel during calibration so the act of introducing gas does not set off the alarm. This will vary from system to system.
2. Fit the calibration gas adaptor to the sensor if this is not a permanent fitment.
3. Flow zero gas for the recommended period for the detector and note the reading. Note that many gas detectors will zero clamp the reading.
4. Flow Calibration gas for the recommended period for the detector and note the reading.
5. Re-introduce zero gas for the recommended period for the detector and follow the manufacturers procedure to zero the detector
6. Re-introduce calibration gas for the recommended period for the detector and follow the manufacturers' instructions to calibrate the detector.
7. Observe and record the detector reading whilst flowing calibration gas.
8. Update the calibration status stickers on the detector.

5.4.2 Calibration Requirements

Zero and Calibration Gas should be applied accordingly.
1). Pressure 800 to 1100mB with standard calibration
2). Flow rate 1 – 1.5 litres / min (With process off)
Calibration Gas to be used should be advised based upon application
Please contact Extronics for further assistance.

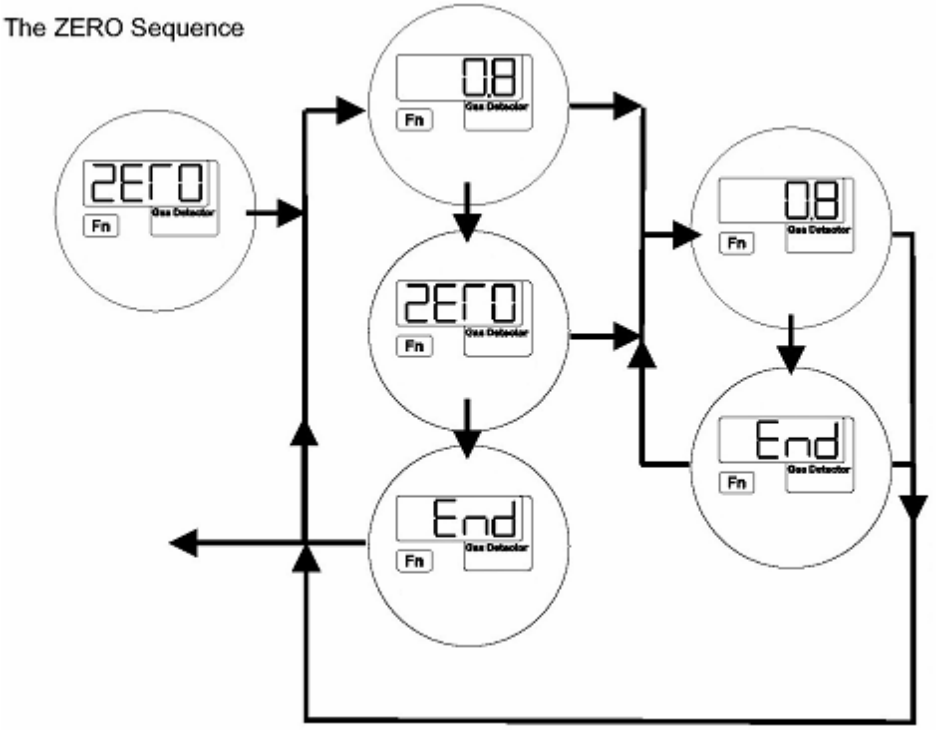
5.4.3 Example of Required Calibration Equipment

Fixed Flow Regulator
Detector to be Calibrated
Gas Adaptor
P/N4011101
Note This adaptor fits
all iGAS Detectors
Calibration Gas Bottle:
When using note the following:
Do not use past the expiry date indicated
Do not use below the recommended minimum fill pressure
Always check the concentration is that required
Check the bottle accuracy (ideally no worse than +/-3% absolute
Check and observe any COSH instructions for safe handling

5.5 Selecting to Zero The iGAS100

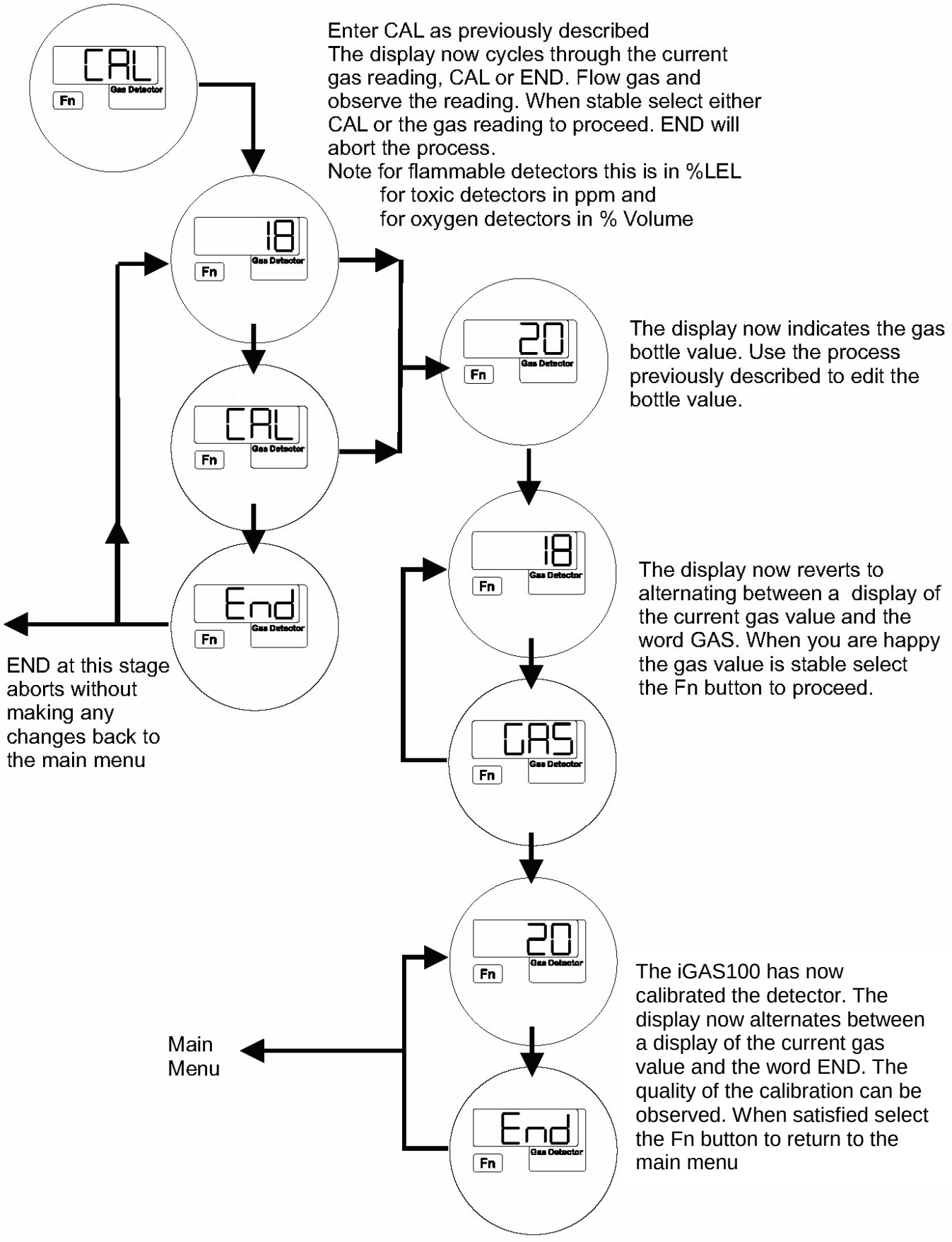
Select to initiate zero

When opting to zero flow appropriate zero gas first and observe the zero condition.
When stable select ZERO from the password protected menus (enter 200 first).
The iGAS100 will zero as soon as the option is selected.
Continue to flow zero gas until the detector indicates the cycle is complete and observe the result



Select to ZERO and the sequence of options Reading, Zero, End will be displayed. End returns you to the main menu options without doing anything. Selecting either the reading or Zero and the iGAS100 will perform a zero. The display then shows the ‘zeroed’ reading and the ‘End’ option. Select either of these options to return to the main menu.

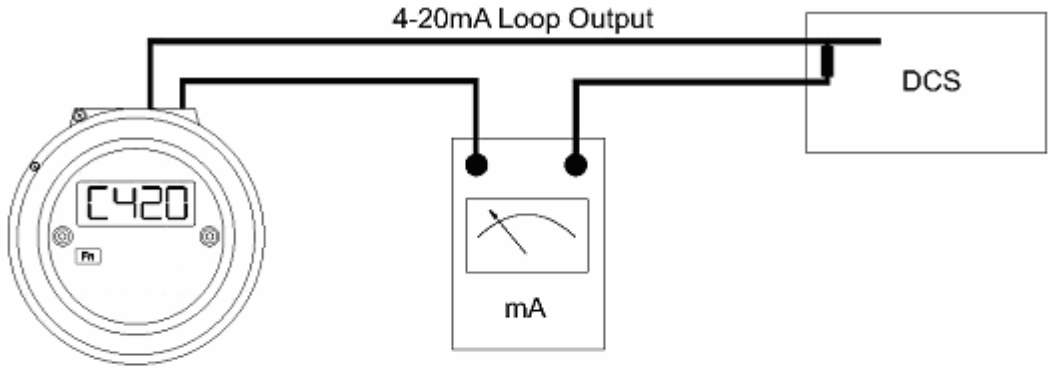
5.6 Selecting to Calibrate the iGAS100


CAL
Fn
Gas Detector
Enter CAL as previously described
The display now cycles through the current gas reading, CAL or END. Flow gas and observe the reading. When stable select either CAL or the gas reading to proceed. END will abort the process.
Note for flammable detectors this is in %LEL
for toxic detectors in ppm and
for oxygen detectors in % Volume
18
20
The display now indicates the gas bottle value. Use the process previously described to edit the bottle value.
End
END at this stage aborts without making any changes back to the main menu
The display now reverts to alternating between a display of the current gas value and the word GAS. When you are happy the gas value is stable select the Fn button to proceed.
GAS
Main Menu
The iGAS100 has now calibrated the detector. The display now alternates between a display of the current gas value and the word END. The quality of the calibration can be observed. When satisfied select the Fn button to return to the main menu

Select to calibrate 4-20mA loop O/P

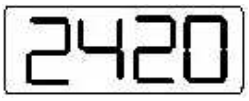
The ‘C420’ function is used to calibrate the 4-20mA loop output by the following method.

1 Using a calibrated ammeter preferably traceable to a national standard measure the loop current.



2 Select the ‘420’ option and set the current loop output to 18mA. Observe and record the meter reading. If it matches the set output current no further action needs to be taken the current output is already set up and calibrated.

3 If the ammeter reading differs from that set using the ‘420’ function then calibrate the loop by using the ‘C420’ function. Whilst the ‘420’ function is still outputting a fixed value select the ‘C420’ function. Now enter the ammeter reading and the loop will correct itself. Use the ‘420’ function again to check that the ammeter and Tocsin 902 are concurrent. Note that it may be necessary to repeat this process a few times if there was a large initial difference.



Select to zero 4-20mA loop O/P

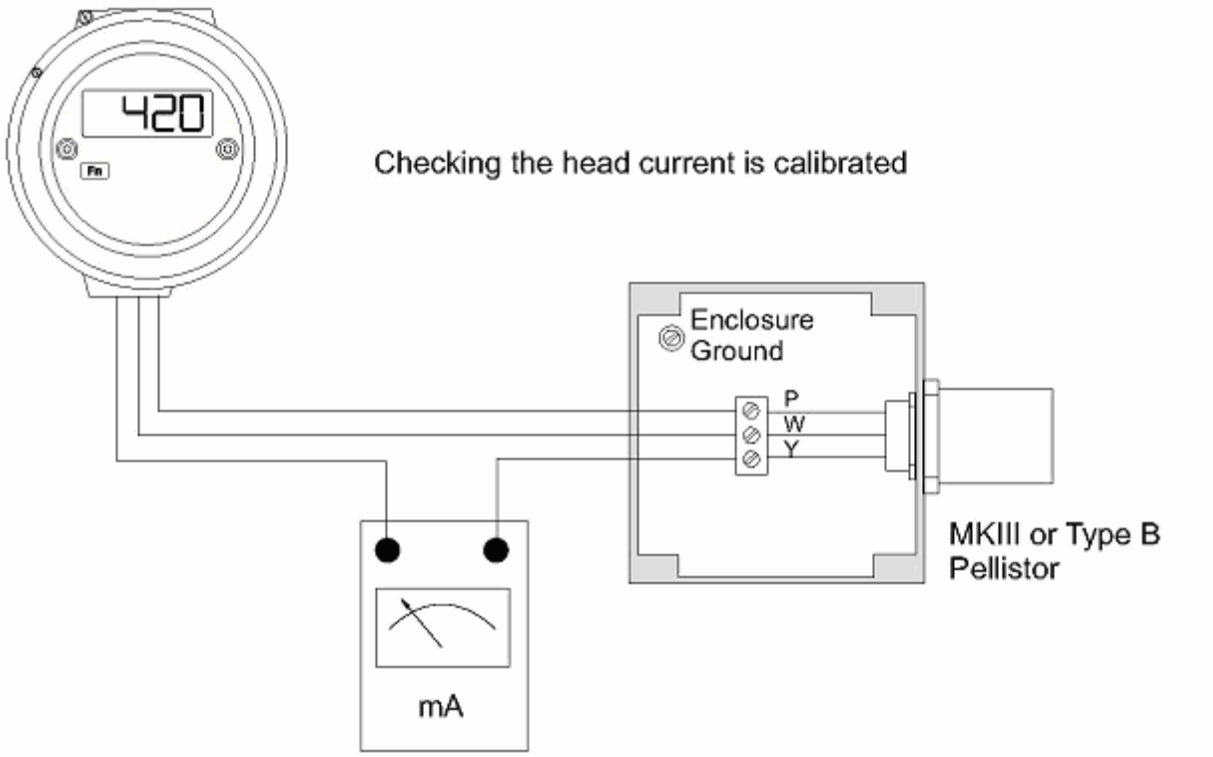
Follow the same basic procedure described for calibration but this time use it to zero the 4-20mA loop output.

Select to force 4-20mA loop O/P

The ‘420’ function allows the user to output a set current for diagnostic purposes on the 4-20mA loop output. The output once set will remain for a short period until the system times out and returns to normal operation or a new value is input. Maximum output value is 35mA.

Select to calibrate the pellistor drive current

This function can be used to eliminate any read errors between the set drive current for a pellistor head and the current measured using an external ammeter. For example if the iGAS100 indicates it is outputting 360mA to the measuring head but an external ammeter indicates 350mA then select C360 and increment the displayed value until 360mA is indicated on the ammeter.

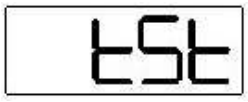


Select to set up initial system zero

The ‘POT 1’ function sets up an initial zero setting using an electronic ‘potentiometer’. Once set at the factory this should not need to be re-set during the operational life of the iGAS100.

Select to set up initial system Gain

The ‘POT 2’ function sets up an initial gain setting using an electronic ‘potentiometer’. Once set at the factory this should not need to be re-set during the operational life of the iGAS100



Select to test relay output function

This option will energise all the output relays for a short period. Note this feature is only operational on models fitted with relay outputs.

Select to return the iGAS100 to normal operational mode.

6 Intended Purpose Usage

Important	**Before setting the units to work, read the technical documentation carefully.**

Important	**The latest version of the technical documentation or the corresponding technical supplements is valid in each case.**

The iGAS100 is built using modern components and is extremely reliable in operation; however it must only be used for its intended purpose. Please note that the intended purpose also includes compliance with the instructions issued by the manufacturer for installation, setting up and service.
Any other use is regarded as conflicting with the intended purpose. The manufacturer is not liable for any subsequent damage resulting from such inadmissible use. The user bears the sole risk in such cases.

6.1 Transportation and Storage

All iGAS100 devices must be so transported and stored that they are not subjected to any excessive mechanical stresses.

6.2 Authorized Persons

Only persons trained for the purpose are authorized to handle the iGAS100; they must be familiar with the unit and must be aware of the regulation and provisions required for explosion protection as well as the relevant accident prevention regulations.

6.3 Cleaning and Maintenance

The iGAS100 and all its components require no maintenance and are self-monitoring. All work on the iGAS100 by personnel who are not expressly qualified for such activities will cause the Ex approval and the guarantee to become void.

6.4 Safety Precautions

Important	**For the installation, maintenance and cleaning of the units, it is absolutely necessary to observe the applicable regulations and provisions concerned with explosion protection (EN 50014, EN 60079-14:2003) as well as the Accident Prevention Regulations.**

6.5 Cleaning and Maintenance Intervals

The cleaning intervals depend on the environment where the system is installed.

6.6 Aggressive substances and environments

The iGAS100 is not designed to come into contact with aggressive substances or environments, please be aware that additional protection may be required.

6.7 Exposure to external stresses

The iGAS100 is not designed to be subjected to excessive stresses e.g. vibration, heat, impact. Additional protection is required to protect against these external stresses.

The iGAS100 will require additional protection if it is installed in a location where it may be subjected to damage.

7 Technical Data

- Toxic Loop Powered
- Pellistor 4-20mA 150mA
- Infrared 90mA
- 903 250mA 24VDC
-

Certification Number	EPSILON 07 ATEX 2286X II 2G Ex d IIC T6
Certification Type	II 2GD Ex d IIC T6 Ex tD A21 IP68 T85°C
Dimensions	145 x 208 x mm
IP Rating	IP68
Ambient Temperature	-20°C to 50°C
Weight	Typically 1.5 kg
Operating Humidity Range	5-60% RH Electo Chem 0-95%RH Non Condensing
Operating Voltage	24VDC or Loop Powered
Repeatability	Sensor Dependant
Zero Drift	Sensor Dependant
Response Time	Sensor Dependant
Cable Entries	2 x M20x1.5mm
Enclosure Material	Epoxy Coated Aluminium Alloy.
Sensor Material	316 Stainless Steel

8 Type Codes

iGAS100 Hazardous Area Gas Sensors **iGAS100-[#1]-[#2]-[#3]**

Specify Option [#1] - Sensor Type

Toxic	T
Infrared	R
Pellistor	P

Specify Option [#2] Junction Box Type

Exd Junction Box with 4-20mA Output Only (**Not Suitable for Standalone Pellistor**)	JB1
Exd Junction Box with Digitally Addressable	JB2
Exd Junction Box With Display, 4-20mA Output and Local Alarm Relays	JB3
Exd Junction Box With Local Display and 4-20mA Output	JB4
Exd Junction Box With Digitally Addressable and Local Display	JB5

Specify Option [#3] Gas Detector type

Nitrogen dioxide	NO2
Sulphur dioxide	SO2
Hydrogen sulphide	H2S
Chlorine	CL2
Oxygen	O2
Nitric oxide	NO
Ammonia	NH3
Ammonia High Level	NH3HIGH
Carbon monoxide	CO
Flammability	FL
Carbon dioxide	CO2
Freon	FREON
Hydrogen cyanide	HCN

Gas types and Sensing Technologies

Type	N02	S02	H2S	CL2	O2	NO	NH3	NH3 High	CO	FL	CO2	FREON	HCN
Toxin	✔	✔	✔	✔	✔	✔	✔	✔	✔	✖	✖	✔	✔
Infrared	✖	✖	✖	✖	✖	✖	✖	✖	✖	✔	✔	✖	✖
Pellistor	✖	✖	✖	✖	✖	✖	✖	✖	✖	✔	✖	✖	✖
FL	✖	✖	✖	✖	✖	✖	✖	✖	✖	100%	✖	✖	✖
ppm Min	10	5	20	5	5%	10	100	250	100	✖	5000	✖	5
ppm Max	50	50	250	50	35%	250	500	5000	1000	✖	5%	5000	200

9 ATEX Marking

NOTE:

TOXIC GAS DETECTOR HOUSING ENGRAVING DETAIL ONLY. POWER DISSIPATION LIMITED TO 2W

Note Serial Number Consists Of

102 Product Type

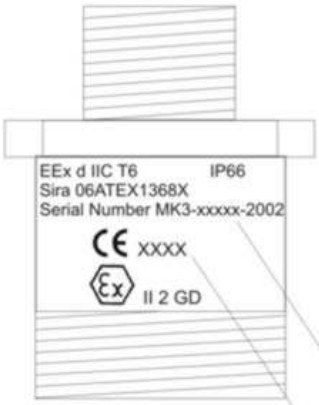
-xxxx First 4 digits sequential Number

xx Last Two Digits Month

-2002 Year Of Manufacture

Notified body ISO reference number

SIDE 1



SIDE 2

Notified body reference number for ISO 9000:2000

Note Serial Number Consists Of

MK3 or B Product Type

-xxxx First 4 digits sequential Number

xx Last Two Digits Month

-2003 Year Of Manufacture

10 Certification

Epsilon Compliance Services
Deeside Lane, Chester
CH1 6DD

Tel: +44 (0)1244 882590
Fax: +44 (0)1244 882599
www.epsilonex.com

Epsilon

1 **EC - Type Examination Certificate**

2 Equipment intended for use in potentially explosive atmospheres

3 Certificate Number: EPSILON 07 ATEX 2286X

4 Equipment: iGas 100

5 Manufacturer: Extronics

6 Address: Meridian House
Roe Street
Congleton CW12 1PG. UK

7 This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 Epsilon, Notified Body number 1712 in accordance with Article 9 of the Council directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems for use in potentially explosive atmospheres given in Annex II to the directive

The examination and test results are recorded in confidential report no RETS(A)2333/A/1, /2, /3 & /4.

9 Compliance with the applicable Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2006	EN 61241-0:2006
EN 60079-1:2004 incl corr 1	EN 61241-1:2004

10 If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by the certificate.

12 The marking of the equipment shall include the following:

Ex II 2 GD Ex d IIC T6 Ex tD A21 IP68 T85°C

On behalf of Epsilon

S Clarke
Director

Date: 06 November 2007

This certificate may only be reproduced in its entirety and without any change, schedule included.
The certificate is only valid when it carries an original signature and holographic security label.
For help or assistance relating to this certificate, contact cs@epsilonex.com.

Epsilon Compliance Services Limited is a trading name of Epsilon Technical Services Limited

UKAS
213

Epsilon Compliance Services
Deeside Lane, Chester
CH1 6DD

Tel: +44 (0)1244 882590
Fax: +44 (0)1244 882599
www.epsilonex.com

13 **Schedule**

14 Certificate Number: EPSILON 07 ATEX 2286X

15 Description of Equipment or protective system

The iGas is made up of a component certified enclosure that has an ATEX approved gas detector fitted to it. The component approved enclosure has the following certificate number FTZU 03 ATEX 0207U. The enclosure has three threaded entries one of which is used to fit a gas detector. The enclosure has a threaded lid with the option of a window being fitted. Both internal and external earthing is provided.

16 Descriptive Documents

16.1 Report No: RETS(A)2333/A/1, /2, /3 & /4.

16.2 Drawings:

Number	Date	Issue	Description
318154	17/10/07	1	ATEX Label Drawing (sheets 1 to 2)
317830	30/05/07	1	iGAS 100 JB1 Configuration (sheet 1 of 2)
317830	30/05/07	1	iGAS 100 JB1 Detail (sheet 2 of 2)
317832	30/05/07	1	iGAS 100 JB2 Configuration (sheets 1 to 2)
317833	30/05/07	1	iGAS 100 JB4 Configuration (sheets 1 to 2)

17 Conditions of Certification

17.1 Special Conditions for Safe Use
The cable entry sizes are set out in the manual, the manual is to be read and understood when fitting cable entries in to this enclosure.

17.2 Conditions for Use
None

18 Essential Health and Safety Requirements
Essential Health and Safety Requirements not covered by section 9:
Covered by manufacturer's instructions.

The manufacturer shall inform the notified body of any modifications to the design of the product described by this schedule

This certificate may only be reproduced in its entirety and without any change, schedule included.
For help or assistance relating to this certificate, contact cs@epsilonex.com.

Epsilon Compliance Services Limited is a trading name of Epsilon Technical Services Limited

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 06ATEX1368X

4 Equipment: MK3 Gas Detector Head

5 Applicant: Extronics Limited

6 Address: Meridian House
Roe street
Congleton
Cheshire
CW12 1PG
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R51A15846A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (amendments A1 & A2)
EN 50018:2000
EN 50281-1-1:1998

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2 G D
EEx d IIC T6

Project Number 51A15846
Date 12 January 2007
C. Index 14

This certificate and its schedules may only be reproduced in its entirety and without change

C Ellaby
Certification Officer
Sira Certification Service

Rake Lane, Eccleston, Chester, CH4 9JN, England

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Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

ST&C(Chester) Form 9225 Issue 4

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 06ATEX1368X

13 **DESCRIPTION OF EQUIPMENT**

The MK3 Gas Detector Head (GDH), consists of stainless steel body, insert and sintered element. The body and insert are connected by a threaded flamepath. The insert can only be fitted and removed by a bespoke tool. In addition the threaded flamepath is sealed with cement (Devweld 531). The sintered element is cemented in position (Devweld 531). The rear of the body incorporates a cemented (Araldite CW1404 GB/HY1456 GB) bushing assembly. This facilitates the passage of flying leads from inside to outside the enclosure. The flying leads are to be terminated in a suitably selected and certified enclosure.

The MK3 GDH has a maximum power dissipation of 1 W.

14 **DESCRIPTIVE DOCUMENTS**

14.1

Drawing No.	Issue	Sheet	Date (Sira Stamp)	Title
3454002	3	1 of 1	12 Jan 07	Pellistor Engraving Detail EXTRONICS

14.2 Report number R51A15846A.

14.3 Certificate number Sira 02ATEX1270X last amended 13 June 2003

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

15.1 The free end of the permanently connected cable must be protected in accordance with EN 50014:1997 clause 14.1.

15.2 In accordance with EN 50018:2000 clause 13.4.2 the rear end of bushing shall be protected by fitting it into a suitably certified enclosure. In addition, the bushing must not be subject to torque during installation.

15.3 The product shall not be connected to portable equipment.

15.4 The product shall be earthed in accordance with EN 50014:1997 clause 15 when fitted to a suitably certified enclosure.

15.5 The MK3 Gas detector head shall not be used as a Safety Related Device in accordance with Directive 94/9/EC.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in report number R51A15846A.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 This product shall be uniquely marked with the label identified in section 14.1 of this certificate.

Date 12 January 2007

This certificate and its schedules may only be reproduced in its entirety and without change

Sira Certification Service
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Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 06ATEX1366X

4 Equipment: TOCSIN 102 Series Enclosure

5 Applicant: Extronics Limited

6 Address: Meridian House
Roe street
Congleton
Cheshire
CW12 1PG
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R51A15846A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (amendments A1 & A2)
EN 50018:2000
EN 50281-1-1:1998

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2 G D
EEx d IIC T6

Project Number 51A15846
Date 17 January 2007
C. Index 14

This certificate and its schedules may only be reproduced in its entirety and without change

ST&C(Chester) Form 9225 Issue 4

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Certification Officer
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Rake Lane, Eccleston, Chester, CH4 9JN, England
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Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 06ATEX1366X

13 **DESCRIPTION OF EQUIPMENT**

The TOCSIN 102 Series Enclosure can be used to form either:

- a TOCSIN 102 Optical Assembly, maximum power dissipation 6 W; this unit utilises a glass window insert and is fitted with an optical unit e.g. camera.
- a TOCSIN 102 Gas Detector Assembly, maximum power dissipation 2 W; this unit utilises a sintered element insert and is fitted with a gas sensor.

The TOCSIN 102 Hazardous Area CCTV Camera Module consists of stainless steel body and insert. These two items are retained by a circlip and connected by a threaded flamepath. Whilst the body is a generic item, there are two types of insert; one incorporates a glass window (102 Optical Assembly) and the other a sintered element (102 Gas Detector Assembly). Both the glass window and sintered element are cemented in position (Devweld 531). The window is also fitted with a backing ring and circlip.

The rear of the body incorporates a cemented (Araldite CW1404 GB/HY1456 GB) bushing assembly. This allows the passage of permanently connected cable from inside to outside the enclosure. The permanently connected cable will be terminated in a suitably selected and certified enclosure.

14 **DESCRIPTIVE DOCUMENTS**

14.1

Drawing No.	Issue	Sheet	Date (Sira Stamp)	Title
3449703	1	1 of 1	22 Nov 06	T102 Engraving Detail 'EXTRONICS'

14.2 Report number R51A15846A.

14.3 Certificate number Sira 02ATEX1271X dated 14 March 2003.

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

15.1 The free end of the permanently connected cable shall be protected in accordance with EN 50014:1997 clause 14.1.

15.2 In accordance with EN 50018:2000 clause 13.4.2 the rear end of bushing shall be protected by fitting it into a suitably certified enclosure. In addition, the bushing must not be subject to torque during installation.

15.3 The product shall not be connected to portable equipment.

15.4 The product that is fitted with a window has only been subjected to reduced risk impact tests in accordance with EN 50014:1997 clause 23.4.3.1; therefore it shall not be mounted in an area where there is a high risk of impact.

15.5 The product shall be earthed in accordance with EN 50014:1997 clause 15 when fitted to a suitably certified enclosure.

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in report number R51A15846A.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 This product shall be uniquely marked with the label identified in section 14.1 of this certificate.

Date 17 January 2007

This certificate and its schedules may only be reproduced in its entirety and without change

Sira Certification Service
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Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

Specialists for intrinsically safe & explosion proof equipment

EC Declaration of Conformity

Extronics Ltd, Meridian House, Roe street, Congleton, CW12 1PG UK

Declare under sole responsibility that the product;

iGAS100 ATEX Certified Gas Detector	II 2GD Ex d IIC T6 Ex tD A21 IP68 T85°C

Certification:

To which this declaration relates is in accordance with the provision of the following directives

94/9/EC	Equipment and protective systems intended for use in potentially explosive atmospheres.
89/336/EC	CE Marking for Electromagnetic Compatibility Directive, amended by **93/68/EEC**
72/23/EC	Low Voltage Directive (LVD), amended by **93/68/EEC**

And is in conformity with the following standards or other nominative documents

BS EN 61000-6-2:1999	Electromagnetic compatibility (EMC) - Generic standards - General standards - Immunity for industrial environments
BS EN 61000-6-4:2001	Electromagnetic compatibility (EMC) - Generic standards - Emission standard for industrial environments
EN60079-0:2006	Electrical apparatus for potentially explosive atmospheres - General requirements
EN60079-1:2004 (Incl corr 1)	Electrical apparatus for explosive gas atmospheres - Flameproof enclosures 'd'
EN61241-0:2006	Electrical apparatus for use in the presence of combustible dust – General requirements
EN61241-1:2004	Electrical apparatus for use in the presence of combustible dust – Protection by enclosures "tD"

Signed: Date: 16/11/07

Nick Saunders
Technical Service Manager

Extronics Ltd · Meridian House · Roe Street · Congleton · CW12 1PG · Tel +44 (0)1260 297274 Fax +44 (0)1260 297280 E-mail info@extronics.com Web www.extronics.com
Incorporated in England and Wales. Registration No. 3076287

11 Manual Revision

Revision	Description	Date	By
01	Initial Release	16/01/08	NS/PL
02	Revised to Include JB5	07/04/08	NS
03	Images for iGAS modified, Calibration info added to with flow rate.	02/06/08	NM